

International Conference on **Geology**

June 22-23, 2015 Florida, USA

Potential paleotsunami records as deduced from coral boulders on the lanyu island, Southeastern Taiwan

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In the last decades, several disastrous tsunamis hit a large area of coastal Asia and produced numerous casualties and economic losses. Taiwan is in urgent need for more knowledge of past tsunami records and potential tsunami genetic source. However, in Taiwan, paleotsunami was not studied until recently, even though many geological evidences of paleotsunami have been found in the Ryukyu Islands close to Taiwan. We expect that the east coast of Taiwan has a large potential for paleotsunami research. We provide evidence from our recent results from the coast of Lanyu offshore southeastern Taiwan. On the basis of detailed geomorphic mapping and field observation, we identified six sites in the northern part of the Lanyu where nine large coral boulders rest on Holocene coral terraces. We mapped their location and measured their profiles and took samples for ^{14}C and U series dating. All the boulders likely moved by extremely strong waves and four sites have better constraints to suggest that the boulders may be transported during paleotsunami event based on large size and their occurrence. The age of the boulders range from 100 to 200 year ago to ca.7000 yBP suggest that the extremely strong wave events occurred at least several times since the middle Holocene and the youngest event may correlate with the 1771 Meiwa tsunami of the southern Ryukyu or alternatively undocumented event along the eastern coast of Taiwan. The location of coral boulder sites suggests that the sources of the events are located to the north of the island.

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Geologic appraisals on the Neogene Sahabi formation in Sirt basin-Libya: On the basis of stratigraphical, paleontological and geochemical

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As Sahabi areas is one of famous vertebrate African localities situated in northern Africa, at the northern Sirt Basin of Libya. Its scientific value is due to the diverse and high abundance of vertebrate fossil remains. Hence, the dating of the exposed vertebrate-bearing member "U1" of Sahabi Formation in As Sahabi area using micro/macro invertebrates is the primary objective of this work. The data base is quite large including eight profiles and two subsurface shallow drilled wells from As Sahabi. Stratigraphically, the Late Neogene rock units of As Sahabi area are well differentiated and correlated by means of both biofacies and lithofacies changes as much as possible. The youngest 'Quaternary' rock unit (Formation "Z") is raised herein to be Formation rather than Member on the basis of the newly recognized unconformity. Whereas, the mineralogical and geochemical analyses are applied to the non-fossiliferous clayey intercalations in Sahabi Formation searching for any datable minerals or microfossil to solve the age enigma of Sahabi Formation, also implemented to understand the source area of the Sahabi clays. The mineralogical and geochemical study of clayey sediments from the vertebrate fossiliferous member of the As Sahabi Formation, using XRD and XRF analyses proved a continental origin from Neogene mega-Lake Chad. Paleontologically, several species have been described and illustrated for the first time from five macrofossils phyla (echinodermata, mollusca, corals, bryozoa and arthropoda) have been described in more detail to a speciation level in As Sahabi area particularly from formation "M". Thirty-five foraminiferal species have been documented from As Sahabi area during this study, mostly from the Pre-Sahabi formation "M"; from which two assemblage biozones are established. Whilst, Sahabi Formation itself yields mainly shallower foraminiferal elements, with very low diversity and bad state of preservation. Seventeen ostracodes species from the pre-Sahabi rock unit (i.e. formation "M") in As Sahabi area have been identified. In addition to that the Pre-Sahabi formation "M" from the subsurface data yielded diagnostic calcareous nannofossils, on which the dating is based. Integrated age of Late Tortonian age is assigned to The Pre-Sahabi Formation "M" based on the above-mentioned tools. Meanwhile the Sahabi Formation, Member "T" which is shallow marine deposits is dated as (post-Tortonian - ? Messinian); meanwhile the terrestrial- marginal marine deposits (Member U1, UD, U2 and V) are of Messinian or younger, base on Foraminiferal contents. Formation "Z" is of Quaternary age.

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